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Application of response surface methodology for fermentation optimization of cherry by *Saccharomyces Cerevisiae*

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Pálinka is a traditional fruit spirit of Hungarian which was originated in the Middle Ages, produced exclusively by the alcoholic fermentation and distillation of fleshy fruit or must of such fruit, berries, or vegetables, with or without stones. In Pálinka production, one of the most important processes affecting the quality and yield of spirits is fermentation. Based on single-factor and three-factor influence level tests by following the Plackett-Burman design, the fermentation process from cherry juice concentrate and *Saccharomyces cerevisiae* by using Response surface methodology (RSM) coupled with the central composite rotatable design was investigated to optimize fermentation conditions through three variables in a defined range of pH (2.75 - 3.75), total soluble solid (18 - 24°Brix) and temperature (15 - 25°C). After 8 fermentation days, fermented cherry fruit reached a production yield of the alcohol 59.68 (9.02 vol.%) and total volatile compounds 2231.68 (337.37 mg/L) at an optimized temperature of 24.71°C, pH 3.25, and total soluble solid 22.49 °Brix. In addition, all the models showed significant p-values for the interaction of variance (0.89 and R-square > 0.94. These results provided important information in serving the basic to develop standard Pálinka production from cherry.